

CHAPTER 1

GENERAL

1-1. Purpose

This manual provides general information, guidance, and criteria for water pollution prevention, control, and abatement programs for Department of the Army activities and installations, including contractor activities located on property under the jurisdiction of the U.S. Army. Direction is provided for formulating pollution control programs at government facilities located in the U.S. where effluent and stream requirements have been or are being established, as well as at overseas installations where guidelines for protecting water resources may not have been formalized. Program steps outlined are intended to conform to basic policy outlined in Executive Order 12088 and implemented by Ar 200-1 and AR 200-2. This directive stipulates that Federal agencies are to design, construct, manage, operate, and maintain their facilities to conform with Federal, State, interstate, and local water quality standards and effluent limitations in accordance with the Federal Water Pollution Control Act, as amended. This manual will assist field offices and commands in formulating water pollution prevention, control, and abatement programs to meet requirements established in the Executive Order which include the following:

- Assurance that all applicable water quality standards and effluent limitations are met on a continuing basis.
- Development of an abatement plan and schedule for meeting applicable standards.
- Presentation of an annual plan for funding of improvements in the design, construction, management, operation, and maintenance of existing and new facilities as may be necessary to meet applicable standards.
- Consideration of the environmental impact for each new facility or modification to an existing facility in the initial stages of planning in accordance with the National Environmental Policy Act.
- Development of cost information on alternative process considerations for new facilities or for modification of existing facilities so that budget requests for design and construction shall reflect the most cost-effective alternative for meeting applicable standards.
- Consultation, as appropriate, with Federal, State, and local regulatory agencies concern-

ing best techniques and methods available for the prevention, control, and abatement of water pollution.

To assist users of the manual, bibliographic references are shown as numbers in parentheses throughout the text to provide in-depth coverage of the processes and treatment trains for the many wastes discussed in this manual.

1-20 Scope

This manual describes principles and procedures to be followed in formulating and conducting a water pollution prevention, control, and abatement program, and in planning facilities required for solution of water pollution problems. The manual provides guidance for selecting and applying proven technologies for wastewater treatment and for solids handling and disposal. Both capital expenditures and operating costs are outlined. While the manual is directed primarily toward handling of domestic wastewaters, system alternatives for handling special process wastes from munitions manufacture and processing, metal plating, washrack, photographic, laundry, hospital and other sources are also addressed. The manual includes technical and cost information needed for project decisions and supporting data. Authority to deviate from guidelines presented herein shall be obtained from HQDA (DAEN-ECE-B), WASH DC 20314-1000. Water pollution problems resulting from surface drainage or storm water runoff are not within the scope of this document. Guidance for pollution prevention from those sources is contained in TM 5-820-1 or TM 5-820-4. Guidance for pollution prevention from Central Vehicle Wash Facilities and from Scheduled Vehicle Maintenance Facilities is not within the scope of this document and will be contained in forthcoming guidance.

1-3. Synopsis

a. Waste water management considerations. Management of water quality at military installations requires evaluation of existing water resources, present and future uses, and existing and potential pollution problems, followed by development and implementation of a program for effective water use and pollution control. Either effluent or stream standards will dictate the treatment performance required. The raw wastewater

characteristics and local site conditions are the most important factors which determine treatment requirements.

b. Nature and origin of waste waters. Wastewater can primarily be classified as domestic or industrial in nature. Industrial wastewaters can be very complex and contain a wide variety of constituents. Before a plan for treating the wastewater can be formulated, these constituents must be identified. Characterization of the waste stream by flow measurement and chemical analysis is used to identify the undesirable elements, to determine the source of these pollutants, and to implement a solution to control them to an acceptable level.

c. Waste water discharge legislation. Over the last decade, legislation and regulations governing the discharge and disposal of wastewater and solid wastes have had a significant impact on all aspects of wastewater management. Under the responsibility of the U.S. Environmental Protection Agency (EPA), Federal legislation, such as the National Environmental Policy Act (NEPA) and the Resource Conservation and Recovery Act (RCRA), have been enacted to reduce or eliminate pollutant discharges and provide for safe handling and disposal of hazardous waste. Other legislation has been enacted to set standards for public drinking water, to control toxic substances, to regulate insecticides, etc. In addition to National regulations, State and local governments have established environmental regulations which in some cases are more stringent than the national counterpart.

d. Waste water management program formulation. The most critical step in effecting pollution control is the initial definition of overall program objectives and content. Without careful planning at an early stage, cost-effective pollution control systems will not be implemented. Other steps which must be taken include conducting a water and wastewater inventory, evaluating waste reduction practices, assessing the environmental impact of various control schemes, analyzing treatment alternatives, and defining specific treatment needs.

e. Wastewater treatment processes. Most pollution control programs at military installations will require upgrading existing wastewater treatment systems to meet more stringent criteria which have been established. Some new facilities will likely be needed in the next 10 years, but the

emphasis will remain on improving performance at present sites. Treatment alternatives must be evaluated to determine the most cost-effective and environmentally acceptable systems for a particular installation. Improved treatment performance may include:

(1) Modifications or additions to preliminary treatment units which may include equalization, pH control, preaeration, or other operations which will reduce the load or improve the efficiency of subsequent facilities.

(2) Changes to primary treatment facilities either to reduce the load on secondary units or to remove specific constituents such as phosphorus.

(3) Upgrading secondary processes by providing additional "polishing" units, by changing the load on existing facilities, or by modifying the plant operations.

(4) Addition of advanced treatment processes to remove or convert nitrogen, to remove phosphorus, or to provide additional suspended solids and organics removal.

f. Solids handling processes. The methods for handling and disposal of removed wastewater residues must be evaluated along with analysis of wastewater treatment processes. Both liquid and solids treatment must be considered in cost-effective evaluations. Resource conservation and beneficial use of waste solids shall be implemented to the maximum practical extent in design and operation of sludge treatment and disposal systems.

g. Waste water handling system alternatives. The process of combining several technically proven unit processes and operations into a treatment system to meet specific effluent goals requires identification of the performance expected from each unit. Usually many combinations of unit processes are available to meet effluent criteria. Operational requirements shall be included in cost evaluations and effect on the environment must be weighed in evaluating alternative processes.

h. Economic considerations. It is the government's desire to implement the most efficient, cost-effective solution to polluted discharges from military facilities. Cost evaluations must consider both capital investment and operation and maintenance expenses on a life cycle basis. The impact of both schedule for start of construction and geographical location of treatment facilities must be evaluated in preparing cost estimates.